

INSTRUCTIONS
FOR
SETTING
EXCELSIOR RANGES

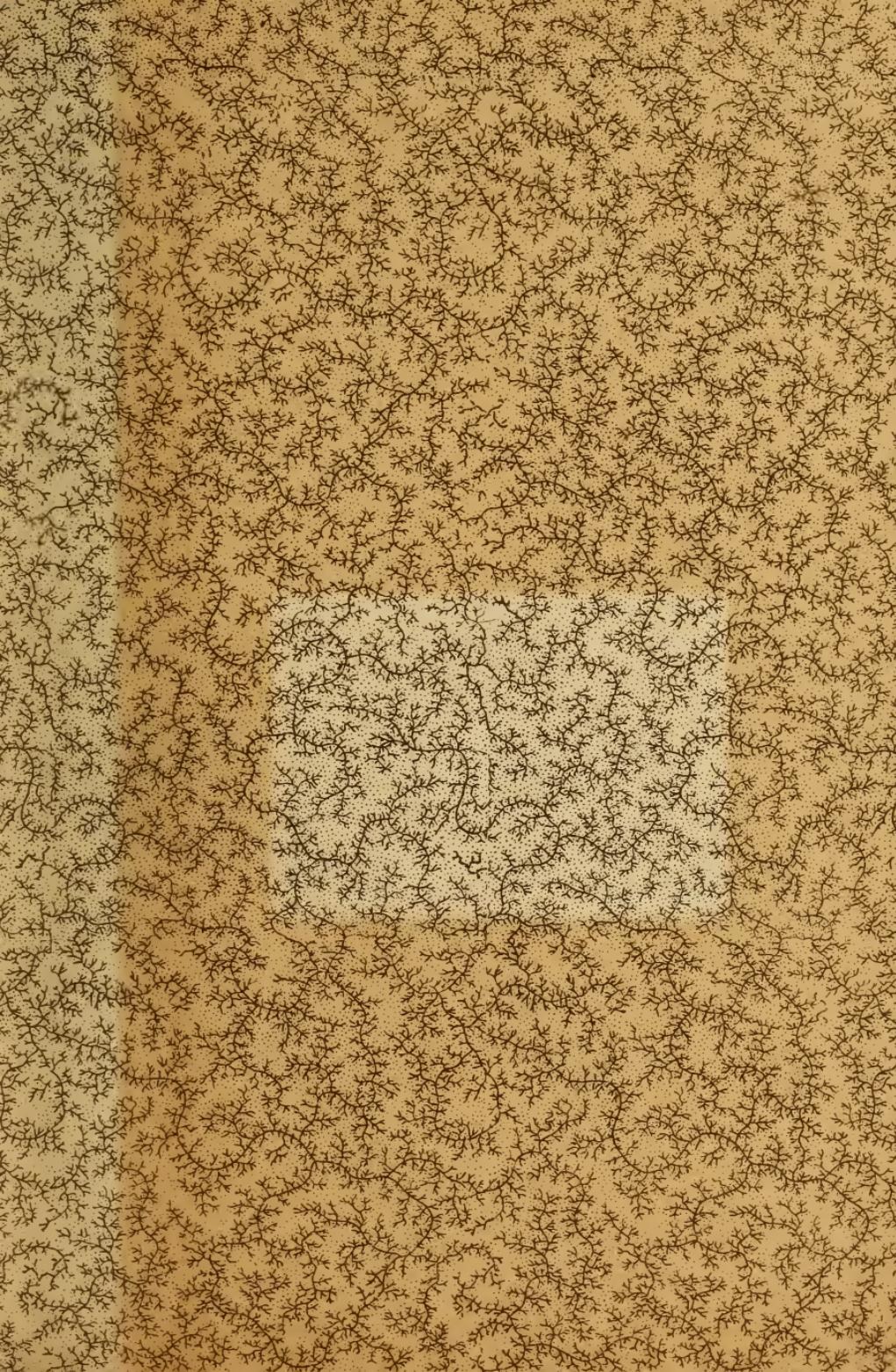
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Instructions for Setting EXCELSIOR RANGES



PUBLISHED BY
ISAAC A. SHEPPARD & CO.,
PHILADELPHIA
1890.

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Instructions for Setting “Excelsior Ranges.”

The peculiar construction of the EXCELSIOR RANGES, the back flues of which are made entirely of brick work, renders careful and proper setting indispensable to their successful operation. This book has been prepared to set forth a method of setting these ranges which the manufacturers recommend as certain, if carefully followed, to secure satisfactory results. In some details, experienced range setters may prefer to depart somewhat from the plan herein given. If, in so doing, they obtain results equally good, no fault can be found. Those, however, who observe the directions following, may feel assured that they are keeping within safe lines.

Dimensions of Chimney.

The smoke flue should be not less than 9 x 9 inches inside measure. Where a Hot Air Range is used, the dimensions of hot air flue may be 6 x 6 inches, but 6 x 9 inches is preferable. Smoke flue and hot air flue should be separated by a gas tight wall, and both flues must be well parquared. In the best work, the hot air flue is lined with tin pipe, although this is not indispensable.

When chimney jambs are too near together to receive range, it may be necessary to cut them altogether away, supporting the chimney by shores until range is set and brick work is carried up to meet it. In all new buildings, however, care should be taken to leave the necessary width, *between the 9 inch chimney jambs*, to receive the range that

is to be used. Do not confound this measurement with the measurements hereafter given for *range foundations*. The proper width between chimney jambs is as follows:

No. 77	Excelsior Range, Single or Hot Air,	36 inches
No. 88	" " " "	38½ "
No. 77	" " Double Oven	52 "
No. 88	" " "	55¼ "

If the range is to be set in a corner, the wall forming one jamb, add 4½ inches to the width given above, to allow for press brick range jamb on that side without cutting into the wall.

After carrying up chimney jambs to a height of 5 feet 10 inches above floor, throw a flat arch across chimney place; and you will have an opening into which range may be set at any time without any cutting except such as is needed to tie in the press brick jambs. Then gather over to either side as desired, to form chimney. If a double oven range is to be used, and it is practicable to gather over from both sides and to form the chimney in centre, it is best to do so; as this will insure an equal draft around both ovens. When the smoke flue is at one side of a double oven range, the oven that is farthest from smoke flue is liable to have a sluggish draft. In such a case a partial remedy may be found in the expedient of cutting away an *additional draft passage* behind the oven damper frame on that side, so as to increase the opening of that oven flue into the chimney.

Mortar.

None but good mortar should ever be used for range-setting—*mortar that will stick*. The usage of a brick set range applies the severest possible test to the mortar joints;

and too much care can not be given to the selection and proper mixing of the materials used for this purpose.

Foundation.

Solid bearings are indispensable, as without them the range is liable to settle irregularly, thus causing cracks to open in the flues.

To find proper depth of foundation for any of our EXCELSIOR RANGES, measure the bottom of range from front to back, and add thereto $9\frac{1}{4}$ inches (the depth of damper frames). This will give correct measure from front to back, unless a Log Boiler is to be used, in which case 5 inches more must be added. To get correct width, measure total width of range between brick jambs, and add the length of the kind of brick with which you propose to set the range.

For our 1890 PATTERN EXCELSIOR RANGES (without Log Boiler), the proper outside measurements of foundations are as follows :

No. 77, with Single Oven, $44\frac{1}{4}$ inches front by 30 inches deep.

88,	"	"	"	47	"	"	30	"	"
77,	"	Double	"	61	"	"	30	"	"
88,	"	"	"	64	"	"	30	"	"

When set with Log Boiler, 35 inches is the proper depth.

Sometimes, when the range is to stand in a corner, the jamb on the oven side can be let three inches into the party wall, leaving a projection of one inch to finish the plastering to, or to receive wainscoting. This practice, however, detracts from the appearance of the range, and is not to be commended.

If there is no cellar under the kitchen, a four-inch wall is sufficient under front of range, and also to carry brick

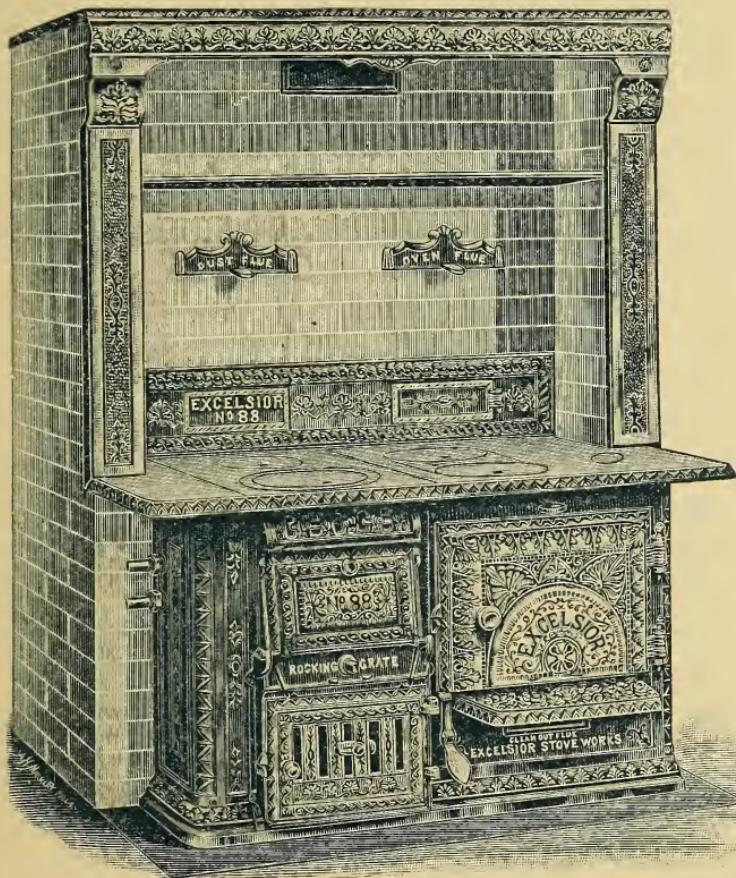
jambs. Trench down for foundation two or three courses below surface of ground, and carry these four-inch walls to within two courses of top of floor, filling the enclosed space with good dirt as you proceed, and ramming it well to make it solid. When filled up, put a heading course of brick around walls, and cover the rest solid, breaking joints over each course. Be sure to fill up all crevices with a grout of mortar or to dash them well in with mortar, as there must be no possible chance left for air to leak under the range into the back flues. Neglect to observe these precautions may result in seriously impairing the draft of the range.

When there is a cellar under the kitchen, it will be necessary to carry up two nine-inch walls from floor to bottom of joist to carry the brick jambs. Throw heavy planking across these piers to carry the body of range, care being taken to cut the planking to such a length as will permit it to rest on the piers *only 4 inches* on each side, as shown at *a b* on cut No. 4. The brick jambs of the range will then have solid bearing *on the piers*, and not on the planking. Cover over the planking solidly with brick to the desired level, filling up all crevices, as before stated.

The bottom of range may be set level with the floor or one or two courses of brick higher, the latter plan being preferred by many.

To Set the Hearth.

The manner of setting hearth, which may be of either brick or slate, is shown in cut No. 3. Keep back one inch or more on front wall at *n*. Nail strip along joist or trimmer at *o*, and span the space with boards, as shown. Cover with mortar at *m*, upon which bed the hearth firmly:



EXCELSIOR RANGE, Single Oven.

Pattern of 1890.

No. 77—Between Jambs, 36 inches; Length of Top, 44 inches; Height, 24 $\frac{1}{4}$ inches; Oven, 16 x 18 $\frac{1}{2}$ inches.

No. 88—Between Jambs, 38 $\frac{1}{4}$ inches; Length of Top, 46 $\frac{1}{2}$ inches; Height, 25 $\frac{3}{4}$ inches; Oven, 17 x 20 $\frac{3}{4}$ inches.

To Set the Plain Single Oven Range.

Whenever it is practicable to cut out the entire wall space back of range four inches, it will save that much room in the kitchen. In setting range against a party wall, this of course cannot be done; but in all cases breaks should be cut out to tie in the jambs, the whole height from floor to top of mantel.

The foundation having been made ready, begin with the oven of Range, and put it carefully into place. Look under it to see whether there is any place at which the front part does not fit true upon the foundation. If so, dash it up with mortar, using the hands to fill the crevice if the trowel should be inconvenient. Then fill up the space under oven solidly with bricks and mortar. Nothing else is so good. If sand is used, it will dry out and settle down. If clay is used, it will crack as it becomes dry. In either case air is liable to be admitted under the oven to the back flue, to the detriment of the operation of the range.

Having done this, place the wing side of range in position, and fit it to the oven portion by putting the fire front between, and bolting up the two upper front bolts. Straighten the back of range perfectly, applying the straight edge and level to the range top throughout, trying on the slip plates and making sure that all is true before putting in the ash pit plates. Then put in ash pit plates, leveling them up carefully, and bolt all parts together securely.

Now fill in behind the range to the bottom of oven flue and dust flue (marked O F and D F on cuts No. 1 and No. 3), sloping the work slightly away from the iron work, to give plenty of clearance to the draft as it passes from the

bottom flue into the back flue. Carry the back flue upwards *in direct contact with back of oven*, the back oven plate forming the front of the flue. Next to the jamb on oven side, only put the brick *on edge*, as shown at L in cut No. 1; and next the dust flue use the *full width* of brick, as shown at S S in Cut No. 1, lapping the back oven plate about an inch, as indicated by the dotted line. This arrangement makes the width of back flue only about three inches less than the width of the back oven plate; and the oven thus receives all the heat possible from this source. Build up to within an inch of the top of range, indicated by T in cuts, before covering over; and use a bar, as at C in cuts No. 1 and No. 3, to carry the wall above. Be careful to see that the rolling damper, marked R D in cuts 1 and 4 works freely, and fits snugly into its place. Provide also for clean-out opening behind hand door in splash plate, as indicated by letters H D in cut No. 4. Line back of flue with brick on edge, as shown at S in cut No. 3.

In finishing the rough work on the dust flue side make the dust flue as large as the opening in the ash pit plate, or a little larger. Dash in mortar to fill up the space between the ash pit and the oven; and fill in solidly with brick and mortar between the ash pit and the wing end of range up to the top of ash pit plates. Now put in the grate and put on the fire brick rest, taking care to fit it down to its place on the ash pit plates. (In the old pattern ranges the grate rest and the brick rest are one and the same.) Put in the fire brick, the waterback and the front grate, and fill in properly to retain back brick and waterback in position. Level off smoothly at height of fire brick under back slip plate, and carry up brick work behind fire to support the wall above.

Build up jambs and front wall to height of splash plate

or a little below it, leveling up all around so as to begin the smooth work of front wall in line with the jambs. After placing splash plate in position draw flues together gradually to meet the dampers, which should be set two or three courses above the splash plate. In all cases keep the rough work above the dampers, an inch away from them, and let it be as free as possible underneath the dampers.

Run smooth work up three courses above splash plate, and then set up the cast iron brackets, which will give the height of the mantel M.

The warming slide may be set two courses above the dampers. The steam valve, marked V in the cuts, is set two courses of brick below the mantel, on the chimney flue side, as nearly as practicable above the middle point of the range. After the dampers are set the flues are sloped gradually to the chimney flue.

In setting any range, all bricks that join the iron work must be well jointed with mortar and all crevices dashed up. All flues must be carefully pargetteted and smoothed with a wet whitewash brush to make a good job. It is best to use a small trowel, with but little mortar on the trowel at a time. After range is set see that *all flues are clear, entirely removing any mortar that may have fallen to bottom of flues*; and also see that the damper blades are clear of mortar, which, if allowed to remain, will become hard and cause them to stick.

Plain Single Oven Range, with Log Boiler.

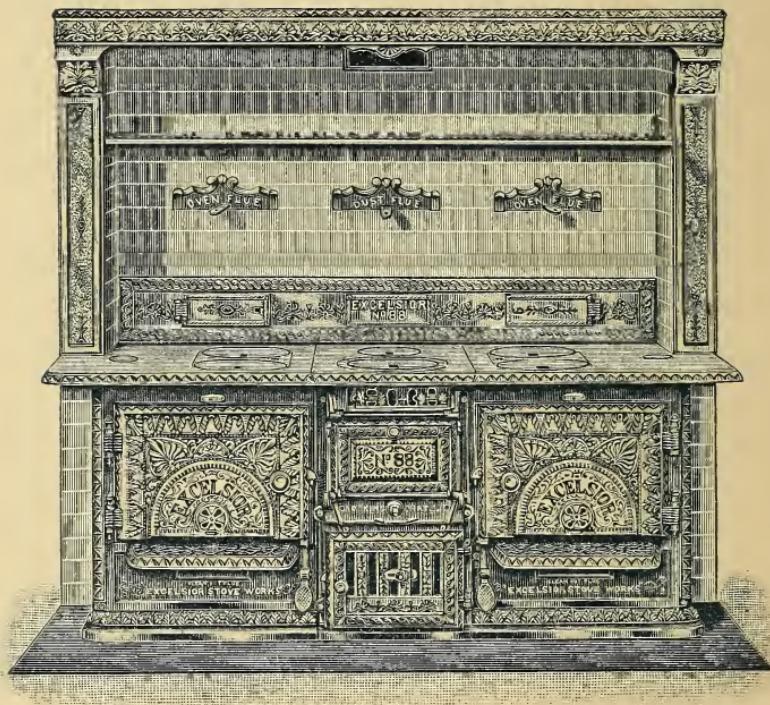
If, instead of a waterback and circulating boiler, a log boiler is to be used, five inches greater depth is necessary. The proper location of boiler is shown by dotted lines L L.,

in cuts No. 1 and No. 9. Set the blank end of the boiler at the height of the top of the oven flue, marked O F, butting the end of boiler against the brick on edge next to jamb. The boiler needs no bearing on that end. Let there be one-half inch clear space between boiler and back of oven, and a four inch flue back of boiler, as shown in cut No. 2, where the arrows indicate the course of draft around boiler. Use a boiler ten inches in diameter and carry up oven flue full width to five inches above top of boiler before covering over, to avoid choking the flue. Throw a bar across on the width to span the oven flue five inches above top of boiler, as shown at C in cut No. 2; and to round the corner, stick up a beveled brick with mortar under this covering bar, as shown in same cut. Brush carefully off boiler any mortar that may have fallen upon it. The dust flue is carried under and up behind boiler in the same way, as shown by dotted lines *d* and *d'*, in cut No. 8. The back wall of flues is carried up over covering bar to meet the dampers, as shown at *n*, in cut No. 8.

In all other respects proceed as in the case of range without log boiler.

Cast Iron Mantel and Brackets.

The cast iron brackets afford an excellent means of protecting the press brick jambs; and the cast iron mantel, marked M in cuts, which in our 1890 PATTERN EXCELSIOR RANGES, is of sufficient depth to give a bearing of $1\frac{1}{2}$ inches to the wall above, adds a beautiful finish to the entire work.



EXCELSIOR RANGE, Double Oven.

Pattern for 1890.

No. 77—Between Jambs, 52 inches; Length of Top, 60 inches; Height, 24 $\frac{1}{4}$ inches; Ovens, 16 x 18 $\frac{1}{2}$ inches.

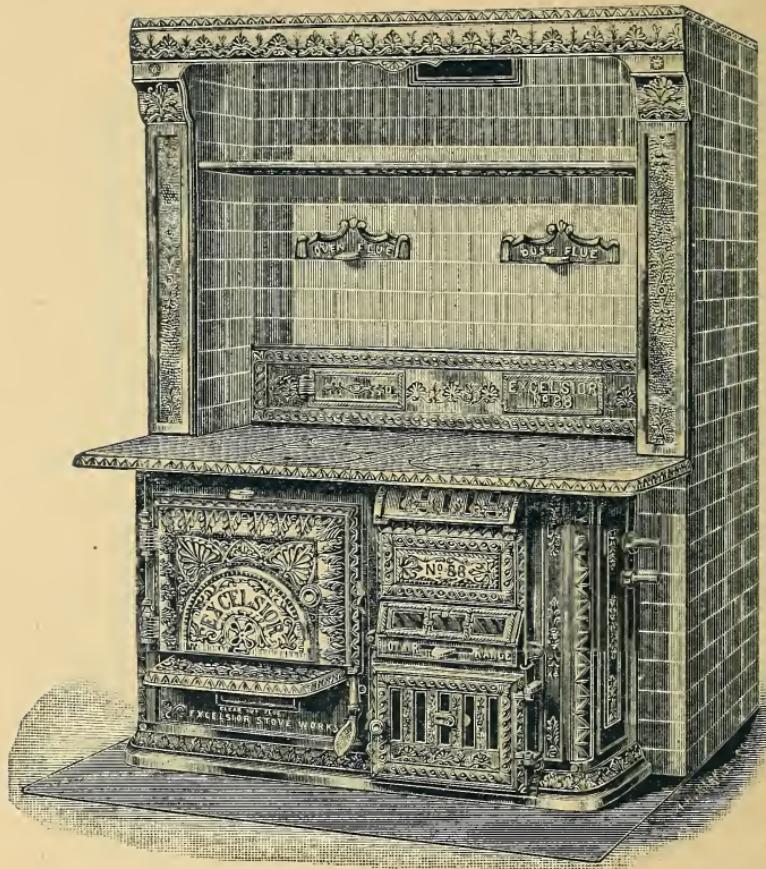
No. 88—Between Jambs, 55 $\frac{1}{4}$ inches; Length of Top, 63 $\frac{1}{4}$ inches; Height, 25 $\frac{3}{4}$ inches; Ovens, 17 x 20 $\frac{3}{4}$ inches.

To Set the Double Oven Ranges.

Inasmuch as the Double Oven EXCELSIOR RANGE differs from the Single Oven only in having an additional oven, a careful reading of the directions for setting the Single Oven Range should be sufficient to enable any one to set the Double Oven Range. The only additional point that seems to require mention, relates to the waterback connections. In the Single Oven Ranges of the 1890 Pattern, the waterback is at the side of the fire, and the connections are made in front of the jamb. In the Double Oven Ranges the waterback necessarily is placed at the back of the fire, and the connections pass from the centre of the waterback, behind the range, to either side, as desired.

When lead pipe is used, these connections are made by means of copper pipes, brazed to the waterback couplings and soldered to the lead pipe outside of jambs; and it is best to arrange these so that they can be carried back and bedded in the back wall of flue, instead of carrying them out through the oven flue. The latter plan not only obstructs the oven flue to some extent, but also, by exposing the pipes to the continued action of the gases in the oven flue, renders them liable to be corroded.

In the case of Double Oven Ranges, the back wall of the flues may be formed of brick *on edge*, instead of on the flat, as shown at *s* in cut No. 3, which will make the oven flues 2 inches deeper, and therefore less apt to need frequent cleaning.



EXCELSIOR HOT AIR RANGE.

Pattern of 1890.

No. 77—Between Jambs, 36 inches; Length of Top, 44 inches; Height, 24½ inches; Oven, 16 x 18½ inches.

No. 88—Between Jambs, 38¼ inches; Length of Top, 46½ inches; Height, 25¾ inches; Oven, 17 x 20¾ inches.

To Set the Hot Air Range.

The foundation for the Hot Air Range is prepared exactly as in the case of the Plain Single Oven Range, except that care must be taken to form the Cold Air Inlet just under joist, as shown at *i* in Cuts 4 and 5, carrying it up, as shown by dotted lines in the cuts, until opportunity is given for cold air to enter range end at *k*. To insure an ample supply, cut one or two inches out of the inside of brick jamb, as indicated by dotted lines around "COLD AIR" space in Cuts 6 and 9.

After putting the oven part into position and filling in under oven, as described in the instructions for setting the plain range, stand up the wing end in its place, and put the fire front into position, securing it by fastening the top bolts. Put on the slip plates, and then see that the whole top is perfectly level, applying straight-edge and level on front as well as back of top and from corner to corner. After getting these parts into place, put in side ash pit plates, bolt them to front, and then put in the back ash pit plate. Do not screw bolts tight until ash box is set complete and grate has been put into place; then, if ash pit is square, screw bolts tight.

Then fill in rough work behind to the level of bottom of oven flue and dust flue, marked O F and D F in cuts, dashing up all crevices with mortar. In forming flues, lay *brick on edge* next to jamb on oven side, as shown at *e* in Cut No. 6. Separate oven flue from dust flue by *brick on edge* at *f* in Cut 6, lapping the back of oven one inch at *s*. Carry these up to within an inch of the range top, the height at which the bar C is to be thrown across. Then build up back wall of *brick on edge*, and cut it off on a bevel, as

shown at *s* in cut No. 3. Dash up and smooth the oven flue.

Then form dust flue on an angle, as shown in cut No. 6, up to the top of opening in back ash pit plate, and fill in dead work between dust flue and brick jamb solidly as high as the dotted line *b* on cut No. 5. This dead work then forms the bottom of the hot air flue, as indicated at *b* on cut No. 4. Fill up with mortar between ash pit and ovens before putting in bottom plate of hot air chamber.

In building up the jamb on wing end let the cold air opening come in two inches on the jamb, as before stated. Fill in along lower edge of ash pit on that side with mortar and small pieces of brick to close any possible crevice that might admit dust from ash pit into hot air chamber. Also fill in at bottom front corner on a slope, as shown at *f* in cut No. 5, so as to give cold air an easy chance to pass upwards through bottom plate of hot air chamber at opening marked *x* in cut No. 6, just in front of check plate. Carry up jamb to top of range, then form dust flue as shown in cut No. 7, with brick *on edge*, beveling off corners at *m* and *g*, to diminish obstruction to passage of hot air. Dash up and smooth hot air flue and dust flue, and fill in corners of iron work at *t* in cut No. 7. Put in the plates that form the top of hot air chamber and bolt them securely in place, putting waterback and cylinder and check plate into proper place, and making sure that everything fits snugly. Fill in back corner at *t*, behind waterback.

Throw bar across hot air flue, level with top of sloping hot air plate, marked *p* in cut No. 5, and let the first course of brick resting on this bar be cut off on a bevel at the back, as shown at *r* in same cut, or set it on edge, as at *C* in cut No. 8, so as to afford the hot air an easy passage. Throw a

bar across oven flue above direct draft opening, as at C in cut No. 4. Build up jambs and front wall to height of splash plate, leveling up all around at height of splash plate or a little below it, according as the jamb courses may come. Then begin the smooth work of front wall in line with the jambs. Mark out position of oven damper and dust damper, which should be set three courses above the splash plate, and build up the several widths marked *e*, *f* and *g*, on cuts 4 and 7 to meet the dampers. Avoid choking the hot air flue, even if you have to leave out the width marked *e* next to jamb on that side.

In setting damper frames notice that the portion that rests on wall has a square opening that must be filled with mortar to keep the damper frame from working loose after it has been set.

Run smooth brick work up three courses above splash plate and then set up the cast iron brackets, which will give the height of the mantel M. If the brackets are not be used, the mantel alone being preferred, carry up the brick work five courses above course that covers dampers before setting steam valve V. Two courses more will give a good height for the mantel. Set the warming slide brackets on the second course above the dampers.

Build the widths above dampers four inches wide. The chimney is as liable to be at the side as in the centre. When it comes at the side give the flues as much slope as possible, as shown in cut No 4. It is not necessary to carry up brick on edge next to jamb, except in cases in which you have to draw over for some distance, when you will need it to rest the bricks on for covering over to chimney. The chimney breast above mantel may be studded out to finish up with lath and plaster work in line with the brick jambs.

After mantel is set a very neat finish is made by running two courses of smooth brick over it, as at *z* in cut No. 5, setting them out to receive plaster line at *w*.

Hot Air Range with Log Boiler.

Begin work on this in exactly the same way as on range without boiler, excepting that an allowance of 5 inches greater depth must be made behind the range. Cuts 8, 9, 10 and 11 show clearly the manner of placing boiler and forming flues.

Build up the widths that form the sides of the respective flues to the height of the top of oven flue and dust flue, marked O F and D F on cut No. 4, laying out the same as shown in cut No. 9. If the boiler head is to come through the jamb on the dust flue side, as shown in drawings, it is best to build up the brick on edge at *e*, next to jamb on oven side, to within an inch or so below top of range before setting the boiler, as this plan gives a better opportunity to dash up and smooth that side of the oven flue. After having leveled up the flues and dead work, set the boiler in position, as shown by dotted lines on cut No. 9, leaving $\frac{1}{2}$ -inch space between boiler and back oven plate. The dust flue as well as the oven flue passes under the boiler and comes up behind it. After setting boiler build up jambs to top of range, following previous instructions as to fire box of range. Cover over the dust flue to boiler, as shown by dotted lines at *d* in cut No. 8. The top of covering should come level with the top of ash pit. It may be necessary to split the bricks to do it. Then cover over well with mortar to prevent any leakage from dust flue into hot air chamber.

Then build up the dust flue behind and over the boiler, bringing it to an angle, as shown in cut No. 10, from *g* to *m*, in order to leave a clear hot air passage the full width of the fire section. Do not carry up the dead work that forms the bottom of hot air flue any higher than the middle of boiler, as shown in cut No. 8, in order that the boiler may get as much heat as possible from the hot air current passing over it.

Span the oven flue across on the width, both back and front, 5 inches above boiler, as shown at C C in cut No. 2, with covering bars, sticking up a beveled brick with mortar under the back covering bar, as shown. Cover over front of hot air passage with bar, as shown at C in cut No. 8, and lay brick *on edge* on this bar first, laying the next course the four-inch way, and beveling off the under corner at the back to give the hot air the freest passage possible from the hot air chamber into the flue. Build up jambs and front wall to height of splash plate, leveling off so as to commence smooth work of front wall on a line with jambs all around. Mark out position of dampers, which should be set three courses above splash plate, beginning with oven damper. Bring out the back of dust flue to meet damper, as shown at *n* in cut No. 8. Build up the several widths *e*, *f* and *g*, as shown in cut No. 11. The manner of gathering around the width between dust flue and hot air flue, from angle at *m* to the square at *g*, is clearly shown in this cut.

Build up smooth work and set brackets, steam valve and mantel as previously instructed.

Concerning Log Boilers.

Where Log Boilers are used, the proper sizes are 3 feet by 10 inches for Nos. 77 and 88, Single Oven, and 4 feet by 10 inches for Nos. 77 and 88, Double Oven. These sizes will furnish hot water more rapidly, and give greater satisfaction than larger sizes. It is a mistake to suppose that more hot water will be obtained by using a larger boiler. The only source of heat for log boilers is the waste heat of the oven flue ; and this is only capable of doing a limited amount of work. We do not regard the log boiler as a desirable arrangement, its only recommendations being that it is cheap, and that a little room in the kitchen is saved by its use. This latter advantage is apparent rather than real, as will be seen when it is remembered that the use of the log boiler compels the range to be set out five inches further into the room.

We make Log Boilers of the very best quality, and also a Patent Combined Log Boiler and Waterback, which is a decidedly superior article. We, however, invariably recommend the use of the waterback and a circulating boiler, as affording the most rapid and satisfactory supply of hot water. As these are often improperly set, even by experienced plumbers, we think it expedient to point out the conditions that are essential to success.

Hints about Circulating Boilers.

1. In a vertical circulating boiler, the cold water supply should pass downwards through a circulating tube to *within five inches* of the bottom of the boiler. If the tube is too short, have it lengthened.

2. Supply pipe from boiler to waterback must be of *full size, unobstructed*, and with a sediment cock at its *lowest point*, where it will drain both boiler and waterback, and keep them clear from muddy deposits.

3. The return pipe from waterback to boiler must have *steady ascent* from waterback to boiler. If at any point it should drop below level of supply pipe, *all circulation will cease*. If lead pipe is used, be careful to see that bends are properly made, so as not to lessen the internal diameter.

4. Boiler should stand *as near to range as possible*. The friction of a long run of pipe greatly retards the flow of water. Pipe used should be of *full size*, also to avoid undue friction.

5. Boilers must always be set *higher than the top of the waterback* with which they are connected. The *higher* the boiler can be placed, the *better* will be the circulation. If the boiler stand is too low, *it must be blocked up*.

6. Above all, the boiler *must not be too large*. It is a common error, and a very great one, to think that the larger the boiler, the greater will be the supply of hot water. A given amount of fire surface will heat just so much water in a given time, *and no more*. Usually $3\frac{1}{2}$ minutes per gallon is a safe estimate for our waterbacks. It is evident that the larger the boiler, the longer will be the time required to heat it thoroughly. For even large families, a 30-gallon boiler, which can be thoroughly heated in an hour and three-quarters, is far more likely to be satisfactory than a 52-gallon boiler, which will require over three hours to heat it thoroughly, and which meanwhile will furnish only luke-warm water.

7. *Proper management of the fire* is essential. It requires a clear, bright, steady fire to heat water; and cooks

who will not take pains to keep ashes and clinker from accumulating against the face of the waterback, will probably experience trouble.

If the conditions above indicated are carefully observed, and the connecting pipes are free from all obstructions, hot water will be furnished with great rapidity. If complaint should arise in any case, a personal examination will probably show that some one or more of the foregoing conditions have not been complied with. Our customers are advised, in such a case, not to rely upon representations made by any other person, but *to make such examination themselves.*

Sifter Grate.

It is often desired to place a sifter grate in the bottom of range ash pit, communicating with ash chute in cellar. Cuts 12, 13 and 14 show the manner of arranging this, in a single oven range, so clearly as hardly to require explanation.

In building ash chute in the cellar set the ash door on second course above the floor; and slope down inside to bottom, as shown by dotted line at *b* in Cut No. 14. Build sides or piers 9 inches wide, and the front 4 inches as shown. To cover ash pit it is best to use iron bars placed crosswise from pier to pier, with a supporting bar beneath them from front to back, as shown at *c* in cuts. Be careful in setting sifter grate to keep the sides parallel with jambs, measuring from centre line of sifter grate.

Set bars not less than three courses below top of floor, as shown on drawings, grouting or dashing up with mortar all crevices, and breaking joints over every course, to get a perfect foundation for range. If it is a hot air range be

careful to make cold air opening as shown by dotted lines at *i* in cuts 4 and 5 ; and be especially careful to see that all joints between cold air flue and ash pit portion are filled up.

Brick Required.

Owing to varied conditions no estimate can be given that will meet every case. In ordinary cases, with plain foundation and no cellar under, a single oven range will require 550 hard brick and 225 press brick ; and a double oven range will require 700 hard brick and 275 press brick. When there is a cellar under, add for piers, 850 hard brick to these figures.

Excelsior Ranges of Earlier Patterns.

As there is no material difference in the methods of setting any of the EXCELSIOR RANGES, any bricklayer who understands the instructions herein given for setting the ranges of the 1890 PATTERN, can readily make such slight adaptations as will be needed to set any of the earlier patterns of the EXCELSIOR RANGES in a proper and satisfactory manner.

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